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BRIEFER ARTICLES.

THE "SOFT SPOT" OF ORANGES.

(WITH PLATE VII)

IN almost any box or lot of oranges in our markets there may be found some specimens which have begun to decay. This decay always begins and proceeds in a definite and characteristic manner, and is common in oranges everywhere, but so far as I can find out its cause has never been determined.

The first sign of the rotting is a slightly discolored spot on the rind, which becomes soft and pulpy at this point. This spot rapidly increases in extent, so that finally the whole orange is reduced to a rotten, mouldy mass, the decay also often extending to other oranges, if they be packed close together. The decayed area is at first but little different in appearance from the unaffected, but soon it becomes covered with a downy, mold-like covering which is white at first, later becoming an olive brownish color. After the orange has reached an advanced stage of decay various molds appear upon it and produce a variety of colors. The rotting affects principally the rind and also the central core-like portion. It does not extend deeply into or proceed rapidly in the fleshy portion, but produces in it a bitter flavor.

To ascertain the cause of this decay flasks of orange gelatin, prune juice, and prune bread were inoculated with small pieces of the decaying rind taken from the inner portion which had not been exposed to the air. In each case a mold-like mycelial growth was rapidly produced from the point of infection, which soon covered the whole nutrient substance. This mycelium was at first white, changing later to olive brown. Microscopic examination showed that this mold was evidently a species of *Penicillium*, but not the ordinary *P. glaucum*. It differed from the latter in color, and also in the size and shape of the spores, those of *P. glaucum* being spherical and about $4\ \mu$ in diameter, while these were elongated and $10-13 \times 6\ \mu$. The described species nearest to this form seems to be *P. digitatum* Fr., Saccardo's description of 1897]

which applies very well except as regards the size of the spores which he gives as $6\ \mu$ in diameter. Notwithstanding this slight discrepancy I judge from the general description that our species is *P. digitatum*, or at least a form of it, an opinion which is corroborated by that of Mr. J. B. Ellis, to whom specimens were sent for determination.

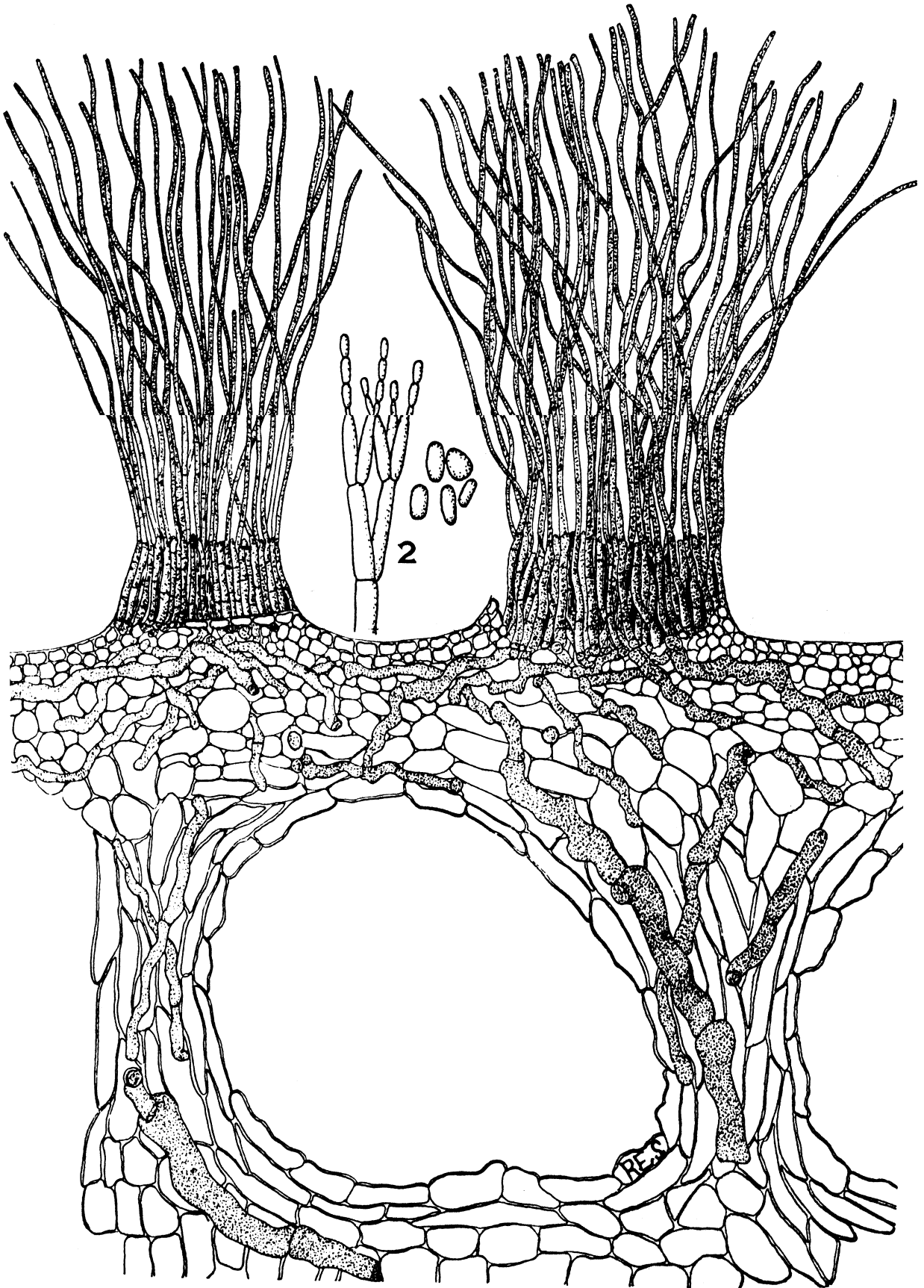
After isolating this fungus attempts were made to produce the decay in sound oranges by infection with spores from artificial cultures. In some cases the spores were simply placed on the rind without puncturing it, while in others the rind was broken. The same was also tried with spores of *P. glaucum*. In each case the oranges were placed in a moist chamber to ensure the germination of the spores. These experiments showed that the characteristic decay is produced by *P. digitatum*, but not by *P. glaucum*, though the latter may come in eventually and much more readily where the rind is injured. It was also found to be greatly favored by a moist atmosphere and close packing together of the fruit.

In the accompanying plate there is shown an enlarged section of the decaying orange rind. Ramifying through the cells are seen the numerous very large filaments which produce the decay. At the surface the filaments aggregate here and there into little pustules which send out clusters of aerial hyphæ as shown in the figure. These form the white mold which appears on the surface of the decaying fruit. On the ends of these filaments the spores are produced (as shown at 2), which give the mold its brown color.

It is interesting to note that since these studies were made the laboratory where they were carried on has become thoroughly infested with *P. digitatum*, which appears at every favorable opportunity, even more commonly than *P. glaucum*.—RALPH E. SMITH, *Mass. Agricultural College*.

NOTES ON NEW MEXICAN FLOWERS AND THEIR INSECT VISITORS.

PROFESSOR HERMANN MÜLLER, in *The Fertilization of Flowers* 570, remarks that in his experience it was rare to find a particular insect visiting exclusively or almost exclusively a particular flower. He cites only seven instances of this sort, all bees. Dours, in his monograph of the bee genus *Anthophora* (1869), remarks: "Quelques-unes, toutefois, fréquentent avec plus de prédilection les mêmes espèces



SMITH on "SOFT SPOT" of ORANGES.